

Clinical skills textbooks fail evidence-based examination

Despite advances in “technological” medicine, the history and physical examination still provide the definitive diagnosis in most cases (1, 2) and remain the cornerstone of clinical medicine (3). Medical students spend a great deal of time learning these techniques. Students continue to be taught the long-case “complete history and physical,” despite its inefficiency and errors. Bordage (4) claims that “you see what you are looking for,” and gathering further data fails to increase diagnostic accuracy. Educational research suggests that diagnostic accuracy depends on both mastery of knowledge and sound problem-solving strategies (5). Students can learn to solve problems more expertly by using schema that assist storage and retrieval of clinical knowledge than by rote memorization of lists and “dispersed” knowledge (5, 6).

Diagnosis involves gathering clinical information and then refining the probability of a particular diagnosis after acquiring each piece of evidence. The elements of history and examination can be considered as individual “diagnostic” tests; thus Bayes’ theorem informs this decision-making approach to diagnosis (3, 7).

Even in familiar settings, clinicians, and students to a greater extent, make erroneous estimates of disease probability given the clinical features of the presentation (8, 9). Clinical textbooks seldom provide the frequency of clinical manifestations of particular diseases, even where good evidence exists (9, 10). Such evidence can help medical teaching focus on diagnostic techniques with proven utility, discarding time-honored but diagnostically unhelpful maneuvers (11).

While teaching clinical students, we noted their difficulty in learning clinical methods and felt that many texts of clinical skills used by students do not assist them, and indeed often add to their confusion. We attempted to determine whether this impression was correct by examining basic clinical skills textbooks.

To do this, we obtained recent editions of clinical skills textbooks recommended by official booklists to students at Australian and Hong Kong medical schools. Pairs of reviewers—2 academic staff and 2 students in the first clinical year of the Queensland course—independently examined each textbook to determine the amount and quality of discussion about the diagnostic process and clinical decision-making; general interpretation of the accuracy and reliability of symptoms and signs discussed in a section or chapter of its own; provision of accuracy and reliability of specific history and examination findings; and information on disease frequency, or relative frequency of a sign in a particular disease.

We found no suitable rating scales, so we assigned a score of 0 to 3 to each question. The reviewers met in pairs to discuss their interpretations and to develop consensus ratings. Other comments noted by each reviewer were analyzed qualitatively for recurring themes.

We obtained 10 textbooks on “physical diagnosis.” 6 originated from the United Kingdom (12-17), 1 from the United States (18), and 3 from Australia (19-21). The most commonly used text was Talley and O’Connor (21) (10 of the 12 medical schools).

The reviewers’ assessments are shown in the Table. Talley and O’Connor (21) would have received a higher score for coverage of reliability of specific symptoms and signs if they had discussed evidence in the body of the text, rather than embedding annotations within the reference lists.

Many texts describe only the traditional approach in which the student is expected to take a complete history in an unspecified time frame, then wait for inspiration—for example “when the facts are complete—to attempt to find a diagnosis” (12). The word “should” was noted to occur frequently—for example, “a rectal examination should be performed on every patient.”

While some books listed questions or examinations as a basic set for each system, none gave the reasons for selecting these particular items (either individually or as a group). The authors thus provided no guide for students to distinguish clinical features with high likelihood ratios.

Most books described or illustrated the severe and classic cases, while omitting conditions commonly seen in primary care—for example, cystitis was often omitted from urology chapters. Content of texts was weighted toward clinical conditions rather than clinical presentations—that is, they discussed the manifestations of disease X rather than how a symptom complex can be analyzed to make the diagnosis. Several texts included sections on radiology and pathology, but we felt that they only partially covered these topics, straying beyond the clinical skills focus without properly integrating the results of tests into the process of diagnosis.

Learning clinical skills is central to the medical course, but we found the textbooks recommended for students to be poorly organized for learning. They failed to integrate lessons from medical education research and available evidence about the effectiveness of aspects of the physical examination. From the texts reviewed, only 3 would earn a barely passing grade according to the rating criteria (18, 20, 21).

Initial rating scores varied little among reviewers, although the students were less critical of identified deficiencies. The summary scores do not communicate the details of whether specific issues were covered. However, our results are consistent with other studies, which find that textbooks consistently fail to report the precision and accuracy of clinical signs (9, 22). Some evidence-based physical diagnosis texts are currently available—McGee (1) is an example, although its limited scope of medical conditions covered, and instructions on physical examination, make it unsuitable as a stand-alone introductory text for students (23).

Students need assistance to progress from the initial all-inclusive approach to the abbreviated approach used by experienced clinicians. Time-efficient, selective clinical examination, without cutting corners that sacrifice diagnostic accuracy, is a complex skill that could be taught more directly using the principles of clinical reasoning and problem solving. Texts on clinical reasoning are available, with Barrows and Pickell (24) and Glass (25) being examples that would suit the needs of medical students.

It may be unrealistic to expect a single book to fulfill all these expectations, but such a book could provide an approach and guide students toward further learning resources. Such discussions need not be lengthy, as shown by Fraser (26).

Introductory texts that teach the mechanics of history taking and physical examination currently fail to use the best available evidence to provide adequate guidance on making clinical decisions in uncertain circumstances.

Rating of clinical skills texts for evidence-based approach*

Textbook (reference)	Discussion about diagnostic process	General discussion of accuracy and reliability	Accuracy of specific signs or symptoms provided	References provided	Relative frequency of disease or clinical finding	Comments
Bates (18)	2	1	0	1	0	Discusses evidence-based medicine and the diagnostic process
Davis (19)	0†	0	0	0	0	A brief primer rather than a textbook
Ogilvie & Evans (12)	0†	0	0	0	0/1	Good diagrams, tables, and photographs
Larkins & Smallwood (20)	2	0	0	1	0/1	Only 1 reference cited in entire book
Talley & O'Connor (21)	1	0	1	2	2	Section correlating symptoms and signs with particular diseases
Munro & Campbell (13)	1	0	0	1	2	Useful chapter conclusions on common pitfalls (very brief)
Lumley (17)	0†	0	0	0	1	Some mention of prevalence of conditions and survival rates
Toghill & Gray (14)	1	1	0	0	2	Tables on common and less common causes for some presentations
Swash & Hutchison (16)	1	1	1	0	0	
Browse (15)	0	0	0	0	0/1	Traditional surgical text, disease-based approach

*0 = no mention of concept; 1 = concept explained briefly, no examples given; 2 = concept explained and some examples given; 3 = concept consistently explained and applied throughout book.

†Cells in which students' rating prior to consensus differed from academics. Their initial rating for each of these 3 texts was "1."

David B. King, MBBS, FRACGP, MPH
University of Queensland
Brisbane, Queensland, Australia

James A. Dickinson, MB, PhD, FRACGP
University of Calgary
Calgary, Alberta, Canada

Maria-Renee Boulton, MBBS
Chris Toumpas, MBBS
Queensland Health Department
Brisbane, Queensland, Australia

References

1. McGee SR. Evidence-Based Physical Diagnosis. Philadelphia: WB Saunders; 2001.
2. Sackett DL, Rennie D. The science of the art of the clinical examination. JAMA. 1992;267:2650-2.
3. Hatala R, Smieja M, Kane SL, et al. An evidence-based approach to the clinical examination. J Gen Intern Med. 1997;12:182-7.
4. Bordage G. Why did I miss the diagnosis? Some cognitive explanations and educational implications. Acad Med. 1999;74:S138-43.
5. Mandin H, Jones A, Woloschuk W, Harasym P. Helping students learn to think like experts when solving clinical problems. Acad Med. 1997;72:173-9.
6. Elstein AS, Schwarz A. Clinical problem solving and diagnostic decision making: selective review of the cognitive literature. BMJ. 2002;324:729-32.
7. Schmidt HG, Norman GR, Boshuizen HP. A cognitive perspective on medical expertise: theory and implication. Acad Med. 1990;65:611-21.
8. Wallsten TS. Physician and medical student bias in evaluating diagnostic information. Med Decis Making. 1981;1:145-64.
9. Richardson WS, Wilson MC. Textbook descriptions of disease—where's the beef? ACP J Club. 2002 Jul-Aug;137:A11-2.
10. Sackett DL. The rational clinical examination. A primer on the precision and accuracy of the clinical examination. JAMA. 1992;267:2638-44.
11. Anderson RC, Fagan MJ, Sebastian J. Teaching students the art and science of physical diagnosis. Am J Med. 2001;110:419-23.
12. Ogilvie C, Evans C. Chamberlain's Symptoms and Signs in Clinical Medicine: An Introduction to Medical Diagnosis. 12th ed. Oxford: Butterworth Heinemann; 1997.
13. Munro J, Campbell I. McLeod's Clinical Examination. 10th ed. Edinburgh: Churchill Livingstone; 2000.
14. Toghill P, Gray D. An Introduction to the Symptoms and Signs of Clinical Medicine. London: Arnold; 2001.
15. Browne N. An Introduction to the Symptoms and Signs of Surgical Disease. 3rd ed. London: Arnold; 1997.
16. Swash M. Hutchison's Clinical Methods. 21st ed. Edinburgh: WB Saunders; 2002.
17. Lumley J. Hamilton Bailey's Physical Signs: Demonstrations of Physical Signs in Clinical Surgery. 18th ed. Oxford: Butterworth Heinemann; 1997.
18. Bickley L, Hoekelman R. Bates' Guide to Physical Examination and History Taking. 7th ed. Philadelphia: Lippincott-Raven; 1999.
19. Davis A, Bolin T, Ham J. Symptom analysis and physical diagnosis. Sydney: Pergamon Press; 1985.
20. Larkins R, Smallwood R. Clinical Skills: The Medical Interview, Physical Examination and Assessment of the Patient's Problem. Carlton: Melbourne University Press; 1993.
21. Talley N, O'Connor S. Clinical Examination: A Systematic Guide to Physical Diagnosis. 4th ed. Sydney: McLennan & Petty; 2001.
22. McAlister FA, Straus SE, Sackett DL. Why we need large, simple studies of the clinical examination: the problem and a proposed solution. CARE-COAD1 group. Clinical Assessment of the Reliability of the Examination-Chronic Obstructive Airways Disease Group. Lancet. 1999;354:1721-4.
23. Simel D. Resource corner: Evidence-based physical diagnosis. ACP J Club. 2001 Nov-Dec;135:A15.
24. Barrows H, Pickell G, Garfield C. Developing Clinical Problem-Solving Skills: A Guide to More Effective Diagnosis and Treatment. New York: Norton; 1991.
25. Glass RD. Diagnosis: A Brief Introduction. Melbourne: Oxford University Press; 1996.
26. Fraser R. Clinical Methods: A General Practice Approach. 3rd ed. Oxford: Butterworth Heinemann; 1999.